



Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 11586 (1986): Malt Sprouts as Livestock Feed Ingredient
[FAD 5: Livestock Feeds, Equipment and Systems]

“ज्ञान से एक नये भारत का निर्माण”

Satyanaaranay Gangaram Pitroda

Invent a New India Using Knowledge



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartṛhari—Nītiśatakam

“Knowledge is such a treasure which cannot be stolen”



BLANK PAGE



PROTECTED BY COPYRIGHT

Indian Standard
SPECIFICATION FOR
MALT SPROUTS AS LIVESTOCK
FEED INGREDIENT

UDC 636.087.24 : [663.432]



© Copyright 1986

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

**SPECIFICATION FOR
MALT SPROUTS AS LIVESTOCK
FEED INGREDIENT**

Animal Feeds Sectional Committee, AFDC 15

Chairman

DR O. N. SINGH

Representing

Ministry of Agriculture & Rural Development
(Department of Agriculture)

Members

AGRICULTURAL MARKETING ADVISER TO THE GOVERNMENT OF INDIA Directorate of Marketing & Inspection (Ministry of Agriculture & Rural Development), Faridabad

DR S. L. ANAOKAR Godrej Soaps Limited, Bombay
DR G. P. MITHUJI (*Alternate*)

DR S. P. ARORA Indian Council of Agricultural Research, New Delhi
DR C. S. BARSAUL C. S. Azad University of Agriculture & Technology, Mathura

DR K. M. SHARMA (*Alternate*)

SHRI M. K. DATTARAJ Roller Flour Millers' Federation of India, New Delhi
SHRI K. B. THIAGARAJAN (*Alternate I*)

DR K. N. PAI (*Alternate II*) BRIG DILBAGH SINGH Directorate of Military Farms, Army Headquarters (Ministry of Defence), New Delhi

LT-COL N. BALASUBRAMANIAN (*Alternate*)

DR P. J. GEORGE KUNJU National Dairy Development Board, Anand
DR A. N. GHOSH Animal Husbandry Commissioner (Ministry of Agriculture & Rural Development), New Delhi

SHRI S. S. CHHIBBER (*Alternate*)

DR S. S. GILL Punjab Agricultural University, Ludhiana
SHRI N. S. GODREJ Compound Livestock Feeds Manufacturers' Association of India, Bombay

SHRI VINEET VIRMANI (*Alternate*)

DR GOPAL KRISHNA Haryana Agricultural University, Hissar
DR KEDAR NATH Indian Veterinary Research Institute (ICAR), Izatnagar

DR D. C. JOSHI (*Alternate*)

DR KRISHAN KUMAR Directorate General of Technical Development, New Delhi

(*Continued on page 2*)

© Copyright 1986

INDIAN STANDARDS INSTITUTION

This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(Continued from page 1)

<i>Members</i>	<i>Representing</i>
DR V. D. MUDGAL	Central Institute for Research on Buffaloes (ICAR), Hissar
DR B. N. GUPTA (<i>Alternate</i>)	All India Cottonseed Crushers' Association, Bombay
DR S. M. PATEL	
SHRI K. M. PAI (<i>Alternate</i>)	
DR B. C. PATNAYAK	Central Sheep & Wool Research Institute (ICAR), Avikanagar
DR MANOHAR SINGH (<i>Alternate</i>)	
DR M. L. PUNJ	All India Research Project on Agricultural By- Products Utilization (ICAR), Karnal
DR D. V. R. PRAKASH RAO	LVR Feeds & Minerals Pvt Ltd, Madras
SHRI L. R. SIVAPRASAD (<i>Alternate</i>)	
DR N. S. RAJAGOPAL	Directorate of Vanaspati, Vegetable Oils & Fats (Ministry of Agriculture & Rural Development), New Delhi
DR D. V. RANGNEKAR	Bhartiya Agro-Industrial Foundation, Uruli Kanchan, Pune
DR A. L. JOSHI (<i>Alternate</i>)	
DR V. R. SADAGOPAN	Central Avian Research Institute (ICAR), Izatnagar
DR (SMT) C. K. SAROJINI	Kaira District Co-operative Milk Producers' Union Ltd, Anand
DR N. SATAPATHY	Tata Oil Mills Co Limited, Bombay
DR S. S. CHHABRA (<i>Alternate</i>)	
DR P. C. SHUKLA	Institute of Agriculture, Gujarat Agricultural University, Anand
SHRI G. V. SIRUR	Solvent Extractors Association of India, Bombay
DR K. SRINIVASAN	Lipton (India) Limited, Bangalore
DR S. V. VAIDYA (<i>Alternate</i>)	
SHRI T. S. RAMBOLIA	Maharashtra Agro-Industries Development Cor- poration Limited, Bombay
DR S. M. SONALKAR (<i>Alternate</i>)	
DR M. L. VERMA	Govind Ballabh Pant University of Agriculture & Technology, Pantnagar
DR D. G. NAIK (<i>Alternate</i>)	
SHRI VINEET VIRMANI	Jawala Flour Mills, New Delhi
SHRI S. KUMAR (<i>Alternate</i>)	
SHRI T. PURNANANDAM, Director (Agri & Food)	Director General, ISI (<i>Ex-officio Member</i>)
<i>Secretary</i>	
SHRI LAJINDER SINGH	
Joint Director (Agri & Food), ISI	

Agro-Industrial By-products Subcommittee, AFDC 15:4*Convener***DR P. C. SHUKLA**

Western Regional Animal Nutrition Station, Anand

*Members*DR S. P. ARORA
DR C. S. BARSUALIndian Council of Agricultural Research, New Delhi
C. S. Azad University of Agriculture and Tech-
nology, Mathura

(Continued on page 9)

Indian Standard

**SPECIFICATION FOR
MALT SPROUTS AS LIVESTOCK
FEED INGREDIENT**

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 31 January 1986, after the draft finalized by the Animal Feeds Sectional Committee, had been approved by the Agricultural and Food Products Division Council.

0.2 Agro-industrial by products are now finding an increasing use in compounding livestock feed. Our agriculture universities have conducted good amount of research work both regarding quality and quantity of it to be used in compounding livestock feed. It is hoped that this standard will help in making available a right quality of malt sprouts for compounded livestock feed industry.

0.3 The malt sprouts is the product obtained by the removal of sprouts from malted barley together with the malt hulls, other parts of the malt and foreign material.

0.4 Inclusion of the aflatoxin limit in the standard did not find favour with the Committee at this stage because of the non-availability of a reliable and quick method for its determination. Further, data for fixing a safe limit in the product meant for livestock feed was also not available. However, it was a considered view of the Committee for fixing this limit as early as possible.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS: 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and method of sampling and test for malt sprouts meant for use as a livestock feed ingredient.

*Rules for rounding off numerical values (revised).

2. REQUIREMENTS

2.1 Description — The material shall be free from adulterants, musty and stale odour, sour or rancid taste and from lumps, dirt and extraneous matter including metallic pieces. The material shall be free from visible fungus or insect infestation.

2.2 The material shall also conform to the requirements specified in Table 1.

TABLE 1 REQUIREMENTS FOR MALT SPROUTS AS LIVESTOCK FEED INGREDIENT

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST, REF TO CL NO. IN IS:7874 (PART 1)- 1975*
(1)	(2)	(3)	(4)
i)	Moisture, percent by mass, <i>Max</i>	10·0	4
ii)	Crude protein ($N \times 6.25$) percent by mass, <i>Min</i>	22·0	5
iii)	Crude fat, percent by mass, <i>Min</i>	0·5	7
iv)	Crude fibre, percent by mass, <i>Max</i>	14·0	8
v)	Acid insoluble ash, percent by mass, <i>Max</i>	2·0	10

NOTE — The values specified for the characteristics at Sl No. (ii) to (v) are on moisture-free basis.

*Methods of tests for animal feeds and feeding stuffs: Part 1 General methods.

3. PACKING AND MARKING

3.1 Packing — Unless otherwise agreed to between the purchaser and the vendor, the material shall be packed in sound jute bags or HDPE bags. The mouth of each bag shall be either machine-stitched or rolled over and hand-stitched with a strong twine.

3.2 Marking — Each bag shall be marked with the following information legibly and indelibly:

- a) Name of the material;
- b) Name of the manufacturer;
- c) Batch or code number;
- d) Net mass in kg, when packed; and
- e) Date of packing.

3.2.1 Each bag may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

4. SAMPLING

4.1 The method of drawing representative samples of the material and the criteria for conformity shall be as prescribed in Appendix A.

5. TESTS

5.1 The tests shall be carried out as prescribed in col 4 of Table 1.

5.2 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (see IS : 1070-1977*) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

A P P E N D I X A

(*Clause 4.1*)

SAMPLING OF MALT SPROUTS AND CRITERIA FOR CONFORMITY

A-1. GENERAL REQUIREMENTS

A-1.0 In drawing, preparing, storing and handling samples, care should be taken that the properties of the material are not affected. The following precautions and directions shall be observed.

*Specification for water for general laboratory use (*second revision*).

A-1.1 Samples shall be taken in a protected place not exposed to damp air, dust or soot.

A-1.2 The sampling instrument shall be clean and dry, when used.

A-1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination.

A-1.4 The samples shall be placed in clean and dry glass containers. The sample containers shall be of such a size that they are almost but not completely filled by the sample.

A-1.5 Each container shall be sealed air-tight with a stopper or a suitable closure after filling in such a way that it is not possible to open and reseal it without detection and marked with full details of sampling, date of sampling, batch or code number, name of the manufacturer and other important particulars of the consignment.

A-1.6 The samples shall be stored in such a manner that there is no deterioration of the material.

A-1.7 Sampling shall be done by a person agreed to between the purchaser and the vendor and if desired by any of them, in the presence of the purchaser (or his representative) and the vendor (or his representative).

A-2. SCALE OF SAMPLING

A-2.1 **Lot** — All the bags in a single consignment of the material drawn from a single batch of manufacture shall constitute a lot. If a consignment is declared to consist of different batches of manufacture, the batches shall be grouped separately and the bags in each group shall constitute separate lots.

A-2.1.1 Samples shall be tested for each lot for ascertaining conformity of the material to the requirements of this specification.

A-2.2 The number of bags to be selected from the lot shall depend on the size of the lot and shall be in accordance with col 1 and 2 of Table 2.

A-2.3 The bags shall be chosen at random from the lot and for this purpose a random number table as agreed to between the purchaser and the vendor shall be used (*see IS:4905-1968**). If such a table is not available the following procedure shall be adopted:

Starting from any bag count 1, 2, 3, etc, up to r and so on in a systematic manner and withdraw the r th bag; r being the integral part of N/n , where N is the total number of bags in the lot, and n the number of bags to be selected according to Table 2.

*Methods for random sampling.

TABLE 2 NUMBER OF BAGS TO BE SELECTED FOR SAMPLING
(Clause A-2.2)

LOT SIZE <i>N</i> (1)	NO. OF BAGS TO BE SELECTED	
		<i>n</i> (2)
Up to 50		2
51 to 100		3
101 to 300		4
301 to 500		5
501 and above		7

A-3. TEST SAMPLES AND REFEREE SAMPLES

A-3.1 Preparation of Individual Samples — Draw with an appropriate sampling instrument, equal quantities of the material from the top, bottom and the sides of each bag selected according to Table 2. The total quantity of the material drawn from each bag shall be not less than 1.5 kg. Mix all the portions of the material drawn from the same bag thoroughly. Take out about 0.75 kg of the material and divide it into three equal parts. Each portion, thus obtained, shall constitute the test sample representing that particular bag and shall be transferred immediately to clean and dry sample containers. These shall be labelled with particulars given in **A-1.5**. The individual sample thus obtained as above shall be formed into three sets in such a way that each set has a test sample representing each bag selected. One of the sets shall be for the purchaser, another for the vendor, and the third for the referee.

A-3.2 Preparation of Composite Sample — From the mixed material from each selected bag remaining after the individual samples have been taken, equal quantities of the material from each bag shall be taken and mixed together so as to form a composite sample weighing not less than 0.75 kg. This composite sample shall be divided into three equal parts and transferred to clean and dry containers and labelled with particulars given under **A-1.5** and sealed airtight. One of these samples shall be for the purchaser, another for the vendor and the third for the referee.

A-3.3 Referee Samples — Referee samples shall consist of a set of test samples (*see A-3.1*) and a composite samples (*see A-3.2*) and shall bear the seal of the purchaser and the vendor and shall be kept at a place agreed to between the two.

A-4. TESTING OF SAMPLES

A-4.1 Test for crude protein shall be conducted individually on each of the samples constituting a set of test samples (*see A-3.1*).

A-4.2 Tests for the remaining characteristics prescribed in Table 1 shall be conducted on the composite sample (*see A-3.2*).

A-5. CRITERIA FOR CONFORMITY

A-5.1 A lot shall be considered as conforming to the specification, when:

- a) each of the test results for crude protein satisfies the requirements as specified in Table 1, and
- b) the test results on the composite sample satisfy the requirements for the remaining characteristics specified in Table 1.

A-5.1.1 If one or more test results do not satisfy the requirements for protein, the following procedure shall be adopted for determining the conformity of the material, for this characteristic.

Calculate the mean and range as follows:

$$\text{Mean } (\bar{X}) = \frac{\text{Sum of the test results}}{\text{Number of test samples}}$$

$\text{Range } (\bar{R})$ = Difference between the maximum and the minimum values of the test results.

The requirement for crude protein shall be considered as fulfilled, if $(\bar{X} - 0.4 \bar{R})$ is equal to or greater than the requirement for crude protein.

A-5.1.2 If the requirement for any of the remaining characteristic(s) is not satisfied after testing the composite sample, a test or tests for the characteristic(s) not satisfying the requirement(s) shall be made on each of the test samples in the set. If the test results obtained on the individual samples satisfy the requirement(s) of the specification for the relevant characteristic(s), then the lot shall be considered as having satisfied the requirement(s) in respect of such characteristic(s).

(Continued from page 2)

<i>Members</i>	<i>Representing</i>
SHRI B. C. CHAKRABORTI	Directorate of Animal Husbandry, Government of West Bengal, Calcutta
SHRI A. K. PAUL (<i>Alternate</i>)	
DR B. K. DASS	Orissa University of Agriculture and Technology, Bhubaneswar
DR A. N. GHOSH	Animal Husbandry Commissioner (Ministry of Agriculture & Rural Development), New Delhi
DR S. S. GILL	Punjab Agricultural University, Ludhiana
DR GOPAL KRISHNA	Haryana Agricultural University, Hissar
DR D. C. JOSHI	Indian Veterinary Research Institute (ICAR), Izatnagar
DR P. J. GEORGE KUNJU	National Dairy Development Board, Anand
DR V. D. MUDGAL	Central Institute for Research on Buffaloes (ICAR), Hissar
DR S. R. SAMPATH (<i>Alternate</i>)	
DR B. C. PATNAYAK	Central Sheep & Wool Research Institute (ICAR), Avikanagar
DR MANOHAR SINGH (<i>Alternate</i>)	
DR M. B. PUROHIT	Dairy Development Commissioner, Government of Maharashtra, Bombay
DR D. V. RANGNEKER	Bhartiya Agro-Industrial Foundation, Uruli Kanchan, Pune
DR D. V. R. PRAKASH RAO	LVR Feeds & Minerals Pvt Ltd, Madras
SHRI L. R. SIVAPRASAD (<i>Alternate</i>)	
DR (SMT) C. K. SAROJINI	Kaira District Co-operative Milk Producers' Union Ltd, Anand
SHRI J. K. SHARMA	MARKFED, Kapurthala
DR K. SRINIVASAN	Lipton (India) Ltd, Bangalore
DR S. V. VAIDYA (<i>Alternate</i>)	
DR S. V. S. VERMA	Central Avian Research Institute (ICAR), Izatnagar
DR H. P. SRIVASTAVA (<i>Alternate</i>)	
SHRI S. P. VIRMANI	Roller Flour Millers' Federation of India, New Delhi
SHRI K. B. THIAGARAJAN (<i>Alternate</i>)	
SHRI VINEET VIRMANI	Compound Livestock Feed Manufacturers' Association of India, Bombay
SHRI VINEET VIRMANI	Jawala Flour Mills, New Delhi
SHRI ANAND VIRMANI (<i>Alternate</i>)	

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>
Plane angle	radian	rad
Solid angle	steradian	sr

Derived Units

<i>Quantity</i>	<i>Unit</i>	<i>Symbol</i>	<i>Definition</i>
Force	newton	N	1 N = 1 kg. m/s ²
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m ²
Frequency	hertz	Hz	1 Hz = 1 c/s (s ⁻¹)
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m ²